IMPORTANT NOTE
for the Materials Webinar

Everyone Please Read…

Participants MUST use the "Optional" teleconference instructions (sent with the invitations and reminder) in order to hear the webinar audio.

Call-in toll-free number: 1-866-842-5779 (US)

Conference Code: 832 898 9197

**Please mute your mic/phone during the presentation*

Locally Administered Projects Manual Updates & Materials Quality Assurance Plan Requirements

March 19, 2015

W. R. Bailey PE
Assistant State Materials Engineer

LAP Manual Updates

Background

- Joint effort between Materials and Local Assistance Division
  - Group of District Materials Engineers, QA Managers, Materials Program Engineers and LAD Program Specialists

Purpose

- Look for opportunities to improve and strengthen LAP program
  - Develop Quality Assurance Plan
  - Coordinate Off-site inspections
    - Table 1 in LAP Manual
  - Explore ways to improve communications
  - Request to manage testing similar to VDOT
    - Allow Localities to follow VDOT guidelines for Materials Testing
  - Provide Training on LAP Manual through webinars

LAP Manual Updates

- **Outcome of Presentation**
  - **What are the major changes being made to the LAP Manual?**
  - **What is the localities' role in executing an effective Quality Assurance Plan?**
  - **Why is the Acceptance/Verification Process important?**
  - **What documentation is needed for Material Acceptance?**
  - **What are some benefits to changes in the LAP Manual?**

Quality Assurance Plan

Materials Acceptance Must Meet VDOT Standards		
Federal-aid	*State-aid / VDOT Maintained*	*State-aid / LPA Maintained*
X	*X*	*N/A*

For federal-aid or VDOT-maintained projects, the LPA shall submit a materials quality assurance plan (QAP) for review and approval, prior to implementation.

Materials Acceptance/Verification Definitions

- **Quality Assurance (QA) – All those planned and systematic actions necessary to provide confidence that a product will perform satisfactorily in service.**

- **Acceptance Testing (AT) - to determine if the quality of produced material meets specification.**

- **Quality Control (QC) – to assess production and construction processes to control the level of quality of the end product.**

LAP Manual Updates

Quality Assurance Plan

Quality Control (QC)

Independent Assurance (IA) + Verification Sampling and Testing (VST)

Acceptance Test (AT) + Inspection

Materials Acceptance/Verification Definitions

- **Independent Assurance (IA) - to evaluate the accuracy of acceptance sampling and testing, operations and equipment by an independent party not responsible for QC or acceptance testing.**

- **Verification Sampling and Testing (VST) – to validate the quality of the product by comparing results to specification.**

Quality Assurance Plan

Quality Assurance Plan

- The plan is developed by the Locality using a template provided in the LAP Manual.

- The LAP Manual contains a QAP commentary providing direction for developing the QAP.

- The plan outlines how the Locality will assure that all materials used on an LAP adhere to the sampling/testing and acceptance processes defined in the LAP Manual. Deviations from the LAP must be clearly documented.

- The QAP must be accepted by the District Project Coordinator before any material is accepted on an LAP.

Quality Assurance Plan

Main Components of the QAP

- Cover Sheet - ("Responsible Charge Person", "Contact Person", Organizational Chart, etc.)

I. Mission Statement - predefined

II. Personnel Certifications

III. Lab Accreditation

IV. Communication channels established

V. Resolution Procedure defined

VI. Progress Reports

Quality Assurance Plan

Main Components of the QAP

VII. Materials Acceptance and Test Data records

VIII. All materials testing, testing methods and frequencies shall follow LAP Manual. Any deviations for the sampling/testing and inspection frequencies are predefined.

IX. A “right to inspect” clause that documents events to be witnessed and hold points.

X. Non-Compliance Report and Recovery Plan

Materials QAP Requirements

- **Acceptance Methods**
  - **Testing**
  - **Inspection**
  - **Certification**
  - **Quality Assurance Plans**
  - **Approved Lists**
  - **Pre-Qualified Lists**
  - **LT Process**

Materials QAP Requirements

How to Use the LAP Manual to Develop a Quality Assurance Plan

Appendix 13.2 – G: Frequency Tables

- Material Type
- Specification and Test Reference
- Acceptance Test
- Verification Test
- Independent Assurance Test
- Number of Tests to run on each material and how often

Materials QAP Requirements

BRIDGE DECK POUR – 405 cubic yard (45 loads)

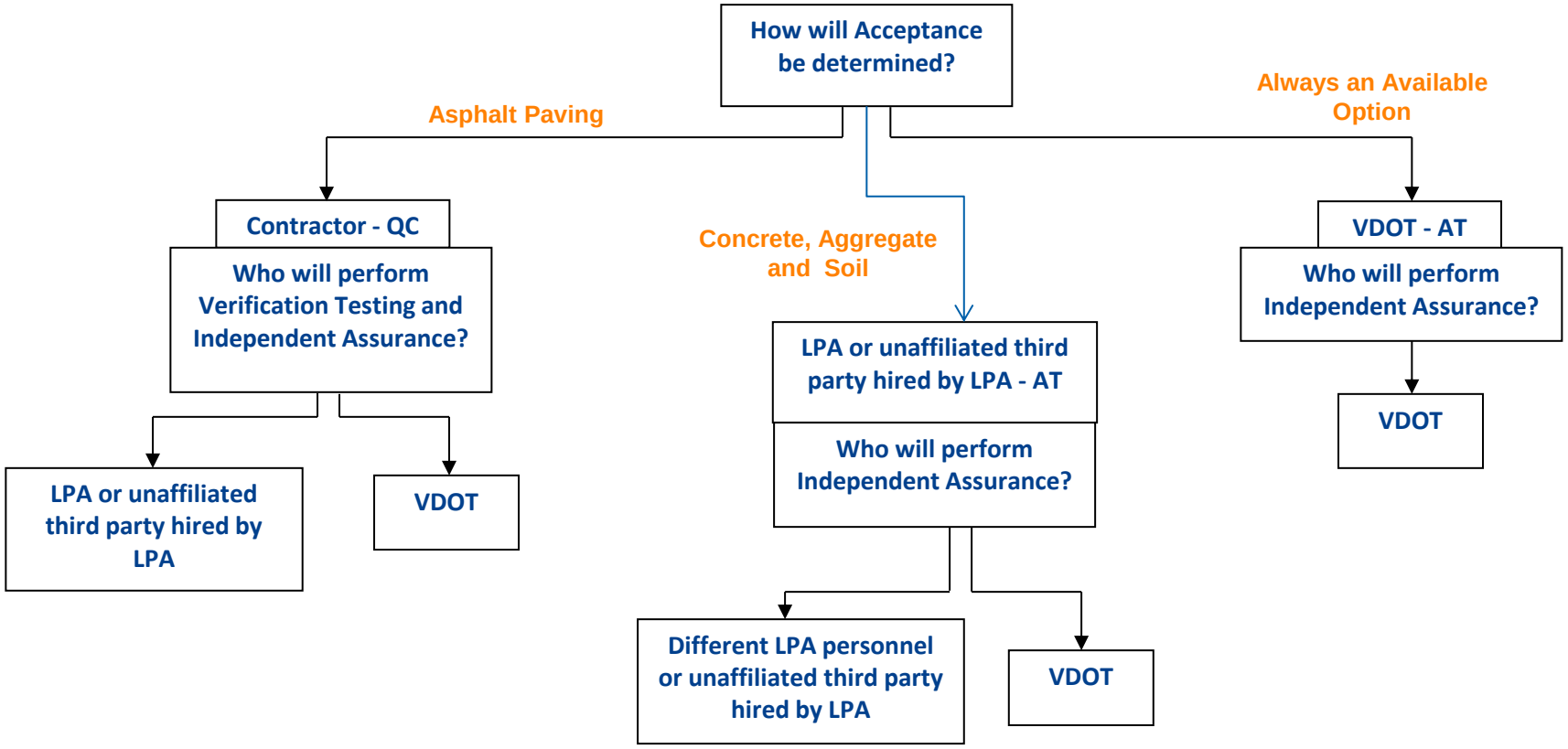
AIR CONTENT

- Inspector AT – 1st 3 trucks (3) then every 3rd load thereafter (14): 3+14 = 17 tests
- VST – NONE
- IA – 5 tests from the same batch as when cylinders cast

Acceptance/VST/IA Frequency - Hydraulic Cement Concrete					
Material Type	**Spec Section**	**Test Reference**	**Acceptance Testing**	**VST**	**IA**
Cast-In-Place Structures and Bridge Concrete	VDOT Section 217				
Concrete Entrained Air Content (CIP Concrete)	217.08	ASTM C231 or C173	Test every load, except for bridge decks, in which case one test per truck-load for the first 3 trucks and then one test for every third truckload thereafter, provided results remain within 1.0% of median of design range. Test also required when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken
Slump of Hydraulic Cement Concrete (CIP Concrete)	217.08	ASTM 143	Test every load and when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken
Temperature of Concrete (CIP Concrete)	217.10	ASTM C1064	Test every load and when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken

Materials QAP Requirements

Quality Assurance Planning Flow Chart for Design-Bid-Build Project Site Testing



Materials QAP Requirements

How to Use the LAP Manual to Develop a Quality Assurance Plan

Appendix 13.2 – C: C-25 (Source of Materials) Example

Complete C-25 by filling in INSP/Test By Column

- List Acceptance method
- Determine Source Qualifications for fabricated items
- Consider ability to perform Source Inspection and testing for manufactured materials at locations other than job site
- Decide to perform inspection or request that VDOT perform inspection

- **Send completed C-25 to VDOT for Review**
  - After approval communicate to Contractor, Inspection staff and VDOT Materials if requesting their services

VIRGINIA DEPARTMENT OF TRANSPORTATION
SOURCE OF MATERIALS

SUBMITTED _____

PROJECT NUMBER EN97-080-115, C502 (UPC 103495) CONTRACT ID. NO. Hanging Rock Trail

PROJECT LOCATION 1.27 Mi. E Rte 795 DISTRICT Salem COUNTY Roanoke

PRIME CONTRACTOR with ADDRESS	SUBCONTRACTOR with ADDRESS	NAME and TELEPHONE NO. of CONTACT PERSON
Joe Smith		Joe Smith
4321 Expansion Drive		804-555-9999
Richmond, VA 231219		

ITEM NO.	SPEC. NO.	ITEM DESCRIPTION	MANUFACTURER and/or SUPPLIER	COMPLETE ADDRESS	VDOT USE INSP/TEST BY:
16242	308 & 309	Aggregate Base Material 21B	Luck Stone Corporation	Po Box 687 Keswick VA 22902	Culpeper Materials will perform plant testing when requested by LPA.
65013 60404	404	Class A3, A4 Concrete	Boxley Concrete	15580 Lynchburg Turnpike Roanoke VA 24064	Approved Mix Design Salem Materials Cylinders to be made by locality or their representative.
40161	520	8",12",16" DI Water Main 12 " sanitary Sewer Pipe	Consolidated Pipe and Supply	225 11th St Roanoke VA 24013	LT Number Required
10612 10636	315	Asphalt Concrete TY BM-25.OA, SM-9.5D	L. H. Sawyer Paving Company	2101 Salem Industrial Drive Salem VA 24153	Approved Mix Design Salem Materials will perform plant testing when requested by LPA.
51347	700	Signal Poles and Mast Arms	Atlantic Technical Sales	14555 Lee Road Chantilly VA 20151	Request Inspection from C.O. Structures section.
00596	302	Precast EW-12 and Precast Items	Permatile Concrete	260 Shanks Road Blountville TN 37617	VDOT Precast QA Program Approved List 34
68125	407	Structural Steel Plate Girders	Hirschfeld Industries Bridge	Po Box 20888 Greensboro NC 27420	Request Inspection from C.O. Structures section

LAP Manual Updates

Opportunity for Improvement in Communication

LAP Manual revisions give communication responsibilities to Locality.

****NOTE: When coordinating a project, the Locality and Local Assistance District Project Coordinator are responsible for proper coordination as follows.**

LAP Manual Updates

Addition of Table 1

The LPA must identify if they are requesting that VDOT perform source inspections for Structural Steel, Signal poles or Pre-stressed Concrete elements when submitting C-25.

Table 1 Testing of Materials by the Department for Off-Site Plant QA Programs

Item	Responsibility
Prestressed Concrete Structural Elements[1] (beams, girders (AASHTO and Bulb-T), and piles	C. O.[2] Materials - Structures Section
Structural Steel Elements[1] (beams and Girders)	C. O. Materials - Structures Section
Metal Traffic Signal poles, Light poles and Arms	Central Office Materials - Structures Section
Laminated Bridge Bearing Pads	C.O. Materials – Physical Lab
Precast Concrete Structures[3]	C.O. Materials – Quality Assurance Section – Approved list #34
Pipe (concrete, steel, aluminum and high Density polyethylene) for culverts, storm Drains and Underdrains[3]	C.O. Materials – Quality Assurance Section – Approved list #25, #26 and #42
Asphalt Concrete QA program[3]	District Materials Section
Aggregate CMA QA program[3]	District Materials Section
Hydraulic Cement Concrete Mix Designs	District Materials Section
Hydraulic Cement Concrete Plant and Truck Inspections	National Ready Mix Concrete Association (NRMCA) Plant and Truck Certification required

Materials QAP Requirements

Galvanized Steel or Aluminum Light Poles

Spec. Section 407 of Road & Bridge Specification for Fabrication Procedures

Welding – Structural Steel or Aluminum Welding Code D1.1 or 1.2

Galvanizing Specification Section - 233

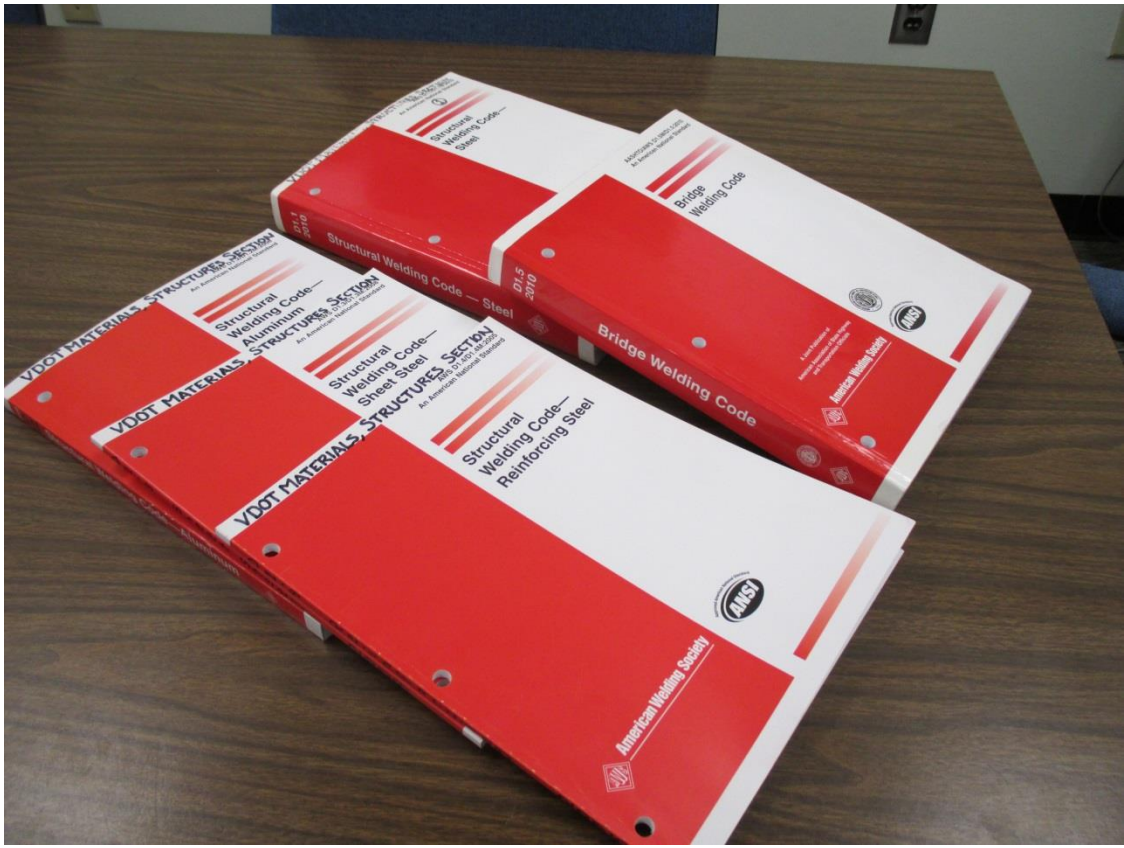
Acceptance – Shop inspected at the source by VDOT or Consultant Inspection agency for VDOT

Materials QAP Requirements

Welding Codes for Steel and Aluminum Structures

Materials Structures Section

- **Experienced Staff**
  - Program Specialist - NDT
  - 3 Engineers
  - 1 Technician
- **Qualifications**
  - Certified Welding Inspectors
  - Prestress Concrete Inspectors
  - Experts in Non Destructive Testing
- **100 Fabrication Plants**
  - Nationwide



LAP Manual Updates

Addition of Table 1

The LPA must identify if they are requesting that VDOT perform source inspections for Asphalt or Central Mix Aggregate materials when submitting C-25.

Table 1 Testing of Materials by the Department for Off-Site Plant QA Programs

Item	Responsibility
Prestressed Concrete Structural Elements[1] (beams, girders (AASHTO and Bulb-T), and piles	C. O.[2] Materials - Structures Section
Structural Steel Elements[1] (beams and Girders)	C. O. Materials - Structures Section
Metal Traffic Signal poles, Light poles and Arms	Central Office Materials - Structures Section
Laminated Bridge Bearing Pads	C.O. Materials – Physical Lab
Precast Concrete Structures[3]	C.O. Materials – Quality Assurance Section – Approved list #34
Pipe (concrete, steel, aluminum and high Density polyethylene) for culverts, storm Drains and Underdrains[3]	C.O. Materials – Quality Assurance Section – Approved list #25, #26 and #42
Asphalt Concrete QA program[3]	District Materials Section
Aggregate CMA QA program[3]	District Materials Section
~~Hydraulic Cement Concrete Mix Designs~~	~~District Materials Section~~
Hydraulic Cement Concrete Plant and Truck Inspections	National Ready Mix Concrete Association (NRMCA) Plant and Truck Certification required

Hot Mix Asphalt QA Program

District Approves Plant

Mix Design

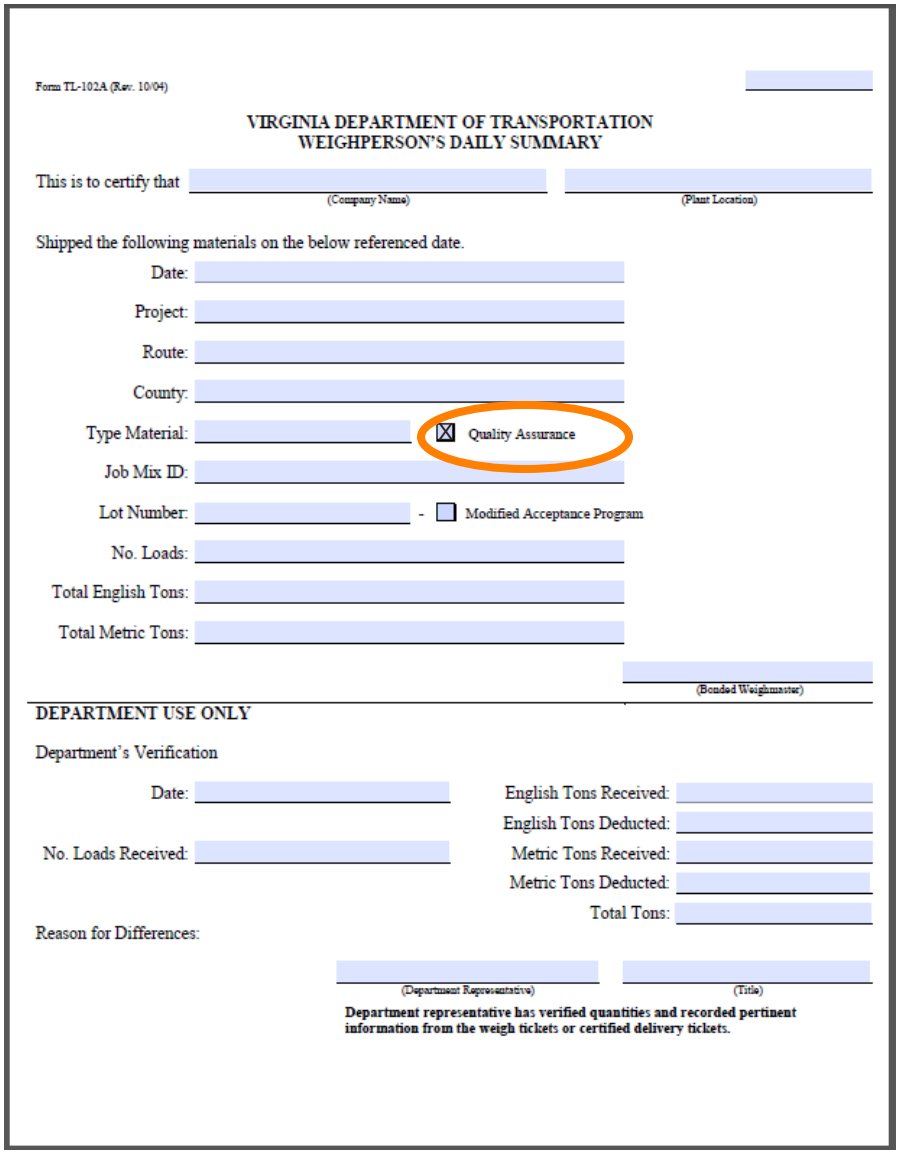
Asphalt IA and VST Testing at plant

Density tested at project

LAP Manual Updates

TL-102:
Weigh Person's Daily Summary

The LPA project manager is responsible for ensuring that the contractor informs the asphalt and aggregate suppliers and VDOT District Materials that their project will be handled the same as a VDOT project, which requires testing and submission of TL-102A for documentation.



Form TL-102A (Rev. 10/04)

VIRGINIA DEPARTMENT OF TRANSPORTATION
WEIGHPERSON'S DAILY SUMMARY

This is to certify that _____ (Company Name) _____ (Plant Location)

Shipped the following materials on the below referenced date.

Date:
Project:
Route:
County:
Type Material: ☒ Quality Assurance
Job Mix ID:
Lot Number: - ☐ Modified Acceptance Program
No. Loads:
Total English Tons:
Total Metric Tons:

_____ (Bonded Weighmaster)

DEPARTMENT USE ONLY

Department's Verification

Date:
No. Loads Received:

English Tons Received:
English Tons Deducted:
Metric Tons Received:
Metric Tons Deducted:
Total Tons:

Reason for Differences:

_____ (Department Representative) _____ (Title)

Department representative has verified quantities and recorded pertinent information from the weigh tickets or certified delivery tickets.

Materials QAP Requirements

Asphalt Plant IA and Verification Testing

LAP Manual Updates

Certifications

- **Special Testing**
  - Mill Analysis – Steel
  - Buy America
- **Pavement Marking Materials**
  - Same as original sample tested and approved
  - Harmful chemicals – Lead
- **Cement, Concrete Admixtures**
  - Annual

LAP Manual Updates

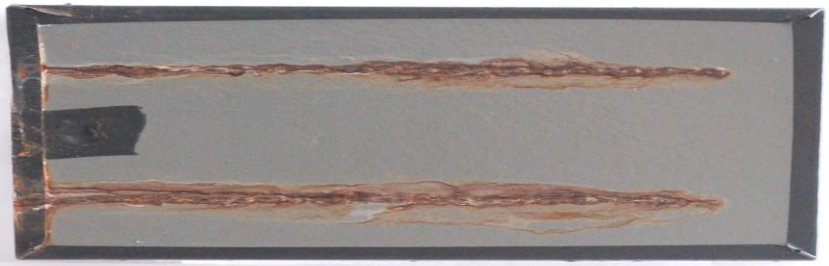
Long Term Performance Tests

- **Approved Lists**
- **Certifications**
  - We certified that the material is the same as the original sample MS 12345 that was tested and approved for List XX
  - Batch test and/or field test

Performance Test Decks

Approved List 17, 20, 73, 74, 75

Approved List 46



Approved List 13

LAP Manual Updates

- **Quality Assurance Plans – Approved lists**
  - **Precast Concrete Items List 34**
  - **Metal, Concrete and Plastic Pipe List 25, 26 and 42**
  - **Asphalt Binder and Emulsions List 50 and 50.1**
  - **Castings – Manhole frames and covers List 61**
  - **Monitored by VDOT Materials**
    - Periodic testing & Inspections

LAP Manual Updates

Precast Concrete QA Program

- Item No. – Various - Drop inlets, risers, adjustment rings with QA stamp
- Spec. No. – Section 302 of Road & Bridge Specification
- Materials Specification Section – 232
- Acceptance – Approved List 34 and Stamped Certified Delivery ticket with statement in accordance with Virginia DOT Precast Concrete QA program

LAP Manual Updates

LT Process

- **Modified Acceptance**
  - Utilities
    - Stamped Catalog Cut/Certification
  - Electrical
    - Pre Approved Traffic Engineering List
    - Stamped Catalog Cut/Certification
- **Special Items**

Utilities Fire Hydrant

Item No. – Attached or on Plans

Spec. No. – Section 520 of Road & Bridge Specification

Materials Specification - AWWA C502 or C503

Acceptance – Certification or stamped Approved Catalog Cuts

LAP Manual Updates

Project Documentation and Traceability during Construction

- **Materials Notebook**
  - Pay Quantities need supporting documents
    - Invoices
    - Inspection Reports
    - Physical Releases TL-109
    - Test Reports (TL forms)
    - Acceptance Tests in Field (TL 13, 28, 58, 59, 60…141)

LAP Manual Updates

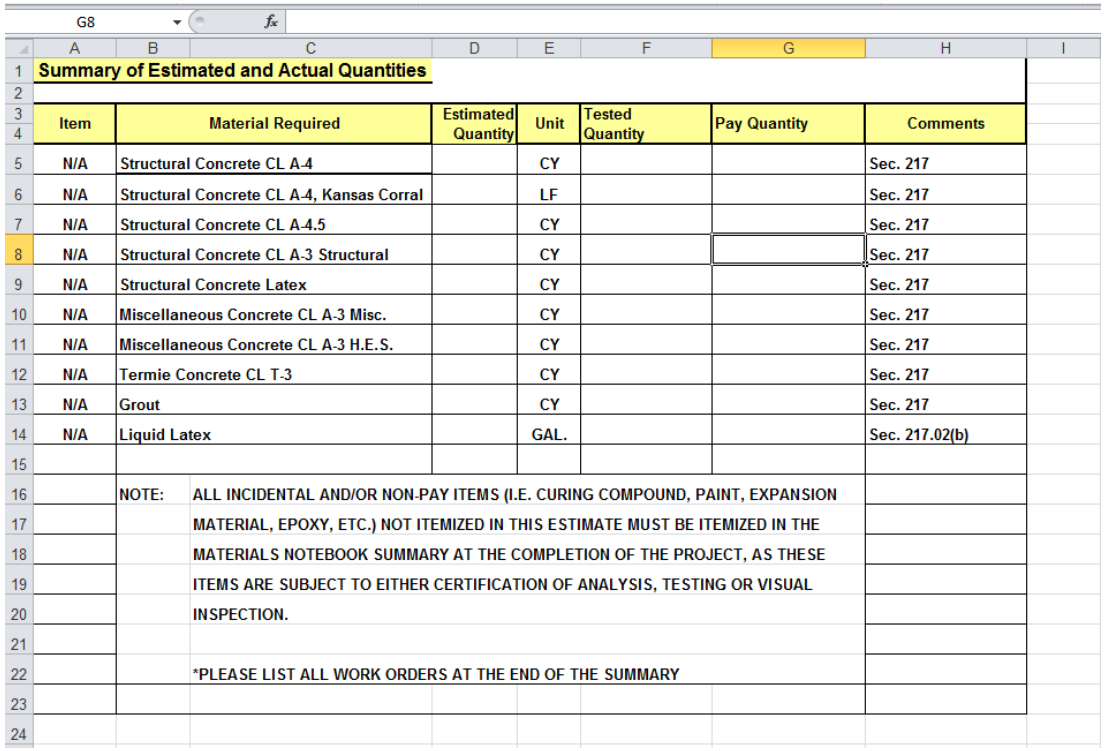
Materials Notebook (TL-142)

LOCALITY IS RESPONSIBLE FOR TRACKING QUANTITIES AND TESTING FREQUENCIES.

Materials Notebook shall be maintained at the job-site and available for inspection.

LAP Manual Updates

Materials Notebook (TL-142)



Summary of Estimated and Actual Quantities

Item	Material Required	Estimated Quantity	Unit	Tested Quantity	Pay Quantity	Comments
N/A	Structural Concrete CL A-4		CY			Sec. 217
N/A	Structural Concrete CL A-4, Kansas Corral		LF			Sec. 217
N/A	Structural Concrete CL A-4.5		CY			Sec. 217
N/A	Structural Concrete CL A-3 Structural		CY			Sec. 217
N/A	Structural Concrete Latex		CY			Sec. 217
N/A	Miscellaneous Concrete CL A-3 Misc.		CY			Sec. 217
N/A	Miscellaneous Concrete CL A-3 H.E.S.		CY			Sec. 217
N/A	Termie Concrete CL T-3		CY			Sec. 217
N/A	Grout		CY			Sec. 217
N/A	Liquid Latex		GAL.			Sec. 217.02(b)

NOTE: ALL INCIDENTAL AND/OR NON-PAY ITEMS (I.E. CURING COMPOUND, PAINT, EXPANSION MATERIAL, EPOXY, ETC.) NOT ITEMIZED IN THIS ESTIMATE MUST BE ITEMIZED IN THE MATERIALS NOTEBOOK SUMMARY AT THE COMPLETION OF THE PROJECT, AS THESE ITEMS ARE SUBJECT TO EITHER CERTIFICATION OF ANALYSIS, TESTING OR VISUAL INSPECTION.

*PLEASE LIST ALL WORK ORDERS AT THE END OF THE SUMMARY

Whoever maintains the project (whether it is VDOT or Locality) must keep the Materials Notebook in the project records for three years after financial closeout of the project.

Materials Certifications

- Must be backed up by inspections and tests
- Must be verified in order to receive payment.

SOURCE OF MATERIALS and MATERIALS NOTEBOOK RESOURCE DOCUMENTS show how to accept each material.

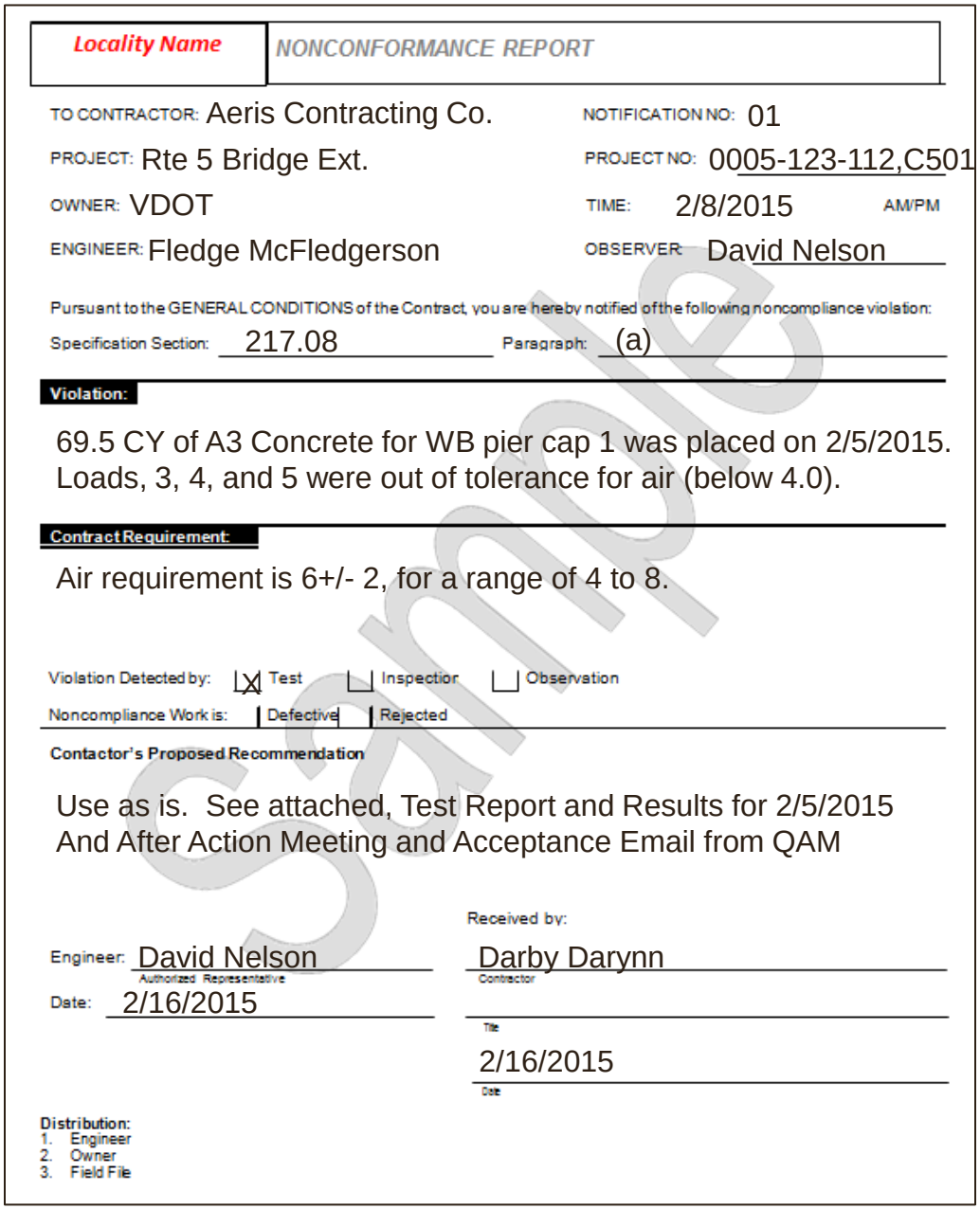
SOURCE OF MATERIALS RESOURCE DOCUMENT

http://www.virginiadot.org/business/resources/bu-mat-MAT.pdf

On VDOT External Website
Materials Division
Materials Documents and Downloads

LAP Manual Updates

Non-Conformance Report (NCR)



Locality Name

NONCONFORMANCE REPORT

TO CONTRACTOR: Aeris Contracting Co. NOTIFICATION NO: 01

PROJECT: Rte 5 Bridge Ext. PROJECT NO: 0005-123-112,C501

OWNER: VDOT TIME: 2/8/2015 AM/PM

ENGINEER: Fledge McFledgerson OBSERVER: David Nelson

Pursuant to the GENERAL CONDITIONS of the Contract, you are hereby notified of the following noncompliance violation:

Specification Section: 217.08 Paragraph: (a)

Violation:

69.5 CY of A3 Concrete for WB pier cap 1 was placed on 2/5/2015. Loads, 3, 4, and 5 were out of tolerance for air (below 4.0).

Contract Requirement:

Air requirement is 6+/- 2, for a range of 4 to 8.

Violation Detected by: [X] Test [ ] Inspection [ ] Observation

Noncompliance Work is: | Defective | Rejected

Contactor's Proposed Recommendation

Use as is. See attached, Test Report and Results for 2/5/2015 And After Action Meeting and Acceptance Email from QAM

Engineer: David Nelson
Authorized Representative

Date: 2/16/2015

Received by:

Darby Darynn
Contractor

Title

2/16/2015
Date

Distribution:
1. Engineer
2. Owner
3. Field File

LAP Manual Updates

Auditing and Nonconformance Recovery Plan (AR Plan)

Locality Name	NOTICE OF CORRECTION OF NONCONFORMANCE WORK

TO Darby Darynn PREVIOUS NOTIFICATION NO: _____ DATE: _____

PROJECT: Rte 5 Bridge Ext. PROJECT NO: 0005-123-112,C501

OWNER: VDOT

ENGINEER: Fledge McFledgerson

The below listed nonconformance work has been re-inspected and the results of the Contractor's corrective actions have placed the work in compliance with the Contract Documents.

Description of Violation:

Of the 8 loads of A3 Concrete placed on 2/5/2015, 3 loads were out of tolerance for air. The QC technician misunderstood the requirements for A3 concrete and did not notify the contractor of the results. The QA Inspector was on site but was performing other duties.

Description of Correction:

After Action meeting, held 2/13/2015, included Aeris Contracting Co. and QC Staff:

- Keep the concrete producer rep on site during pour
- Show air/slump retests on test reports
- Report failing or borderline test results immediately to Engineer
- Keep mix design and spec book on site

I accept this concrete because:

- All A3 Concrete is from the same plant which has so far met 4000 psi at 28 days
- Permeability results have also passed thus far
- The average air for all 8 loads meets air requirements (4.1%)

Distribution:

1. Engineer
2. Owner
3. Field File

CURRENT LAP MANUAL REQUIREMENT

TL-131 (LAP):
Letter of Materials Certification

Certifies that:

- **Acceptance testing of all materials met specification**
- **All independent assurance samples were within tolerance of samples used for QC/AT**
- **Certifications and test reports are on file**
- **Signed by the LPA Construction Project Manager**

The form must include failed materials and corrective actions taken, including pay adjustments.

LAP Manual Updates

LPA Materials related questions should first be directed to the:

- **District Project Coordinator (PC)**
- **Construction Project Monitor (CPM)**

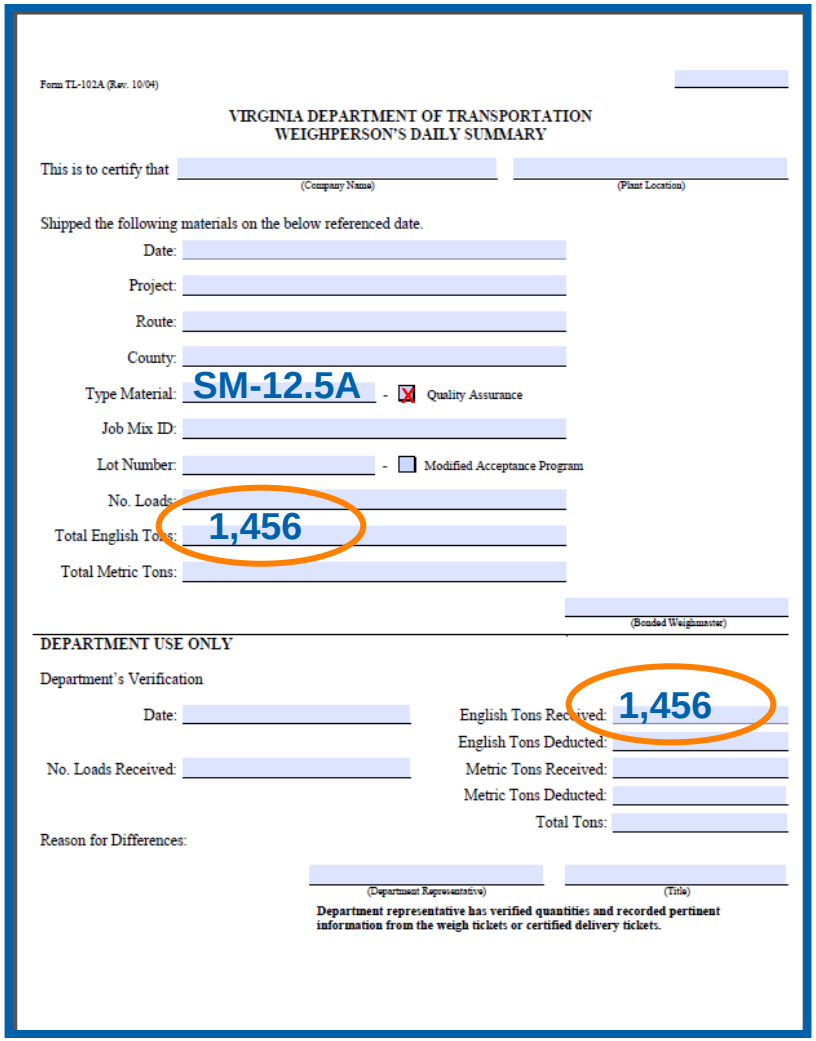
The PC or CPM will coordinate with:

- District Materials Engineer
- District Materials QA Manager (Field Operations)
  - Approved Ready Mix Suppliers in District
  - Approved Aggregate Suppliers
  - Approved Asphalt Suppliers
- District Notebook Person
- CO Materials Quality Assurance Section
- CO Materials Structures Section

PAVING PROJECT EXAMPLE

PAVING PROJECT EXAMPLE

1,456 tons of Surface mix were received and placed on a project. No loads were rejected. Approximately two lane miles have been paved.



Form TL-102A (Rev. 10/04)

VIRGINIA DEPARTMENT OF TRANSPORTATION
WEIGHPERSON'S DAILY SUMMARY

This is to certify that _____ (Company Name) _____ (Plant Location)

Shipped the following materials on the below referenced date.

Date:
Project:
Route:
County:
Type Material: SM-12.5A - ☒ Quality Assurance
Job Mix ID:
Lot Number: _____ - ☐ Modified Acceptance Program
No. Loads:
Total English Tons: 1,456
Total Metric Tons:

_____ (Bonded Weighmaster)

DEPARTMENT USE ONLY

Department's Verification

Date:
No. Loads Received:

English Tons Received: 1,456
English Tons Deducted:
Metric Tons Received:
Metric Tons Deducted:
Total Tons:

Reason for Differences:

_____ (Department Representative) _____ (Title)

Department representative has verified quantities and recorded pertinent information from the weigh tickets or certified delivery tickets.

PAVING PROJECT EXAMPLE

Go to Appendix 13.2.G Frequency Tables in the LAP Manual.

QC/VST/IA Frequency - Asphalt

Material Type	Spec Section	Test Reference	Contractor QC Testing	VST	IA
Asphalt Concrete Pavement	VDOT Section 315				
Pavement Density by Nuclear Method with In Place Pavement Density (Asphalt Pavement)		VTM-76, VTM-6	Establish Roller pattern, control strips and test sections, 10 stratified random density test sites per test section (5,000 ft.)	VST is performed on Twenty (20) percent of QC lots. Obtain two cores in one randomly selected QC lot out of five lots to verify in place density. Minimum one VST sample per project.	IA=10%*QC Readings Locality representative observe and witness QC testing to assure gauge is calibrated and accurate. Observe and verify test sites are random and match selected sites. Verify that QC tests are done using proper procedures. Observe one control strip per density technician and obtain all cores from control strip for reweighing in laboratory (randomly select a minimum 10% of cores) to confirm field density testing.

NUCLEAR DENSITY TEST

- Contractor QC – 20 density test sites
- VST - Obtain 2 cores at one location.
- IA – Observe 2 density tests being performed, obtain control strip cores to reweigh

PAVING PROJECT EXAMPLE

Independent Assurance Testing:

Roller Pattern

PAVING PROJECT EXAMPLE

Independent Assurance Testing:

Roller Pattern

ASPHALT NUCLEAR DENSITY THIN LIFT ROLLER PATTERN - WORKSHEET

Control Strip No: 1

Project or Schedule	PM-2D-13	Item No.		Date	6/21/13
Route	81	From	13.76	To	11.04
Directional Lane (NBL, SBL, etc.)	SBL			Lane (inside, center,	Inside
Mix Type	SM- 9.5D	Application Rate:	165 lbs/yd²	(	kg/m²)
Producer	Asphalt Inc.	Location	Ketchum, VA		
Roller Type:	Roller 1 DD-130	Roller 2	DD-110	Roller 3	

Roller Pattern Data

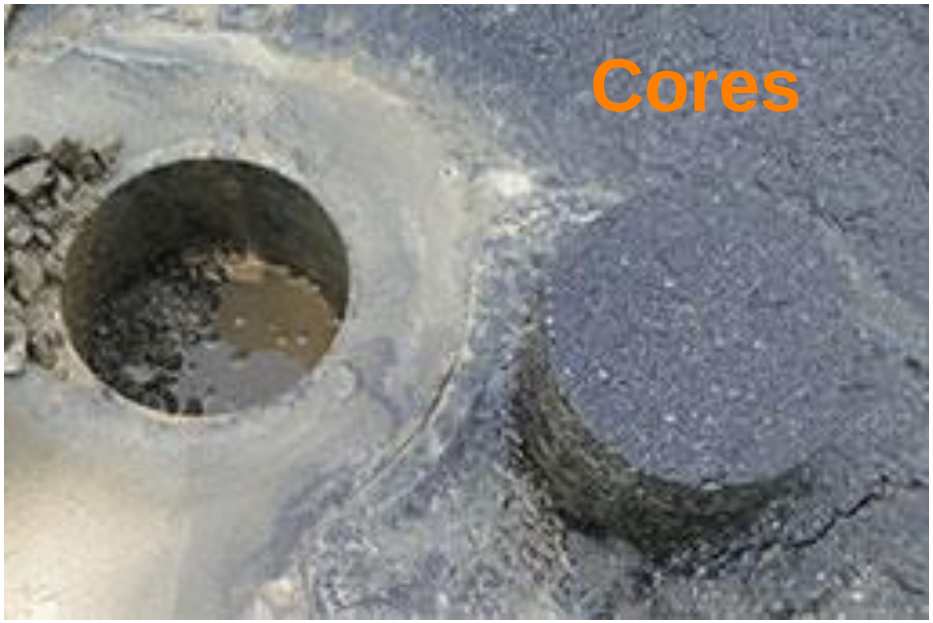
Gauge Model: 4640-B | Serial No: 401 | Calibration Date: 5/18/13 | Depth Setting: 1.5 in. (mm)

Pass No	Nuclear Density	Pass No	Nuclear Density
2V		6 (3S)	
Site 1	135.5	Site 1	142.7
Site 2	136.6	Site 2	143.9
Site 3	134.8	Site 3	140.2
AVERAGE	**135.6**	AVERAGE	**142.3**
Pass No 3 V	Nuclear Density	Pass No 7 (4S)	Nuclear Density
Site 1	139.5	Site 1	142.3
Site 2	142.4	Site 2	143.0
Site 3	137.9	Site 3	139.5
AVERAGE	**139.9**	AVERAGE	**141.6**
Pass No 4 (1S)	Nuclear Density	Pass No	Nuclear Density
Site 1	142.6	Site 1	
Site 2	144.0	Site 2	
Site 3	139.9	Site 3	
AVERAGE	**142.2**	AVERAGE	
Pass No 5(2S)	Nuclear Density	Pass No	Nuclear Density
Site 1	142.7	Site 1	
Site 2	144.4	Site 2	
Site 3	140.5	Site 3	
AVERAGE	**142.5**	AVERAGE	

Testing Performed by: _____ Observed by: _____

PAVING PROJECT EXAMPLE

IA and Verification Sampling and Testing



PAVING PROJECT EXAMPLE

APPENDIX 13.2 - E

Independent Assurance Tolerances

Test	IA Comparison Tolerance *	Source
Soil/ Aggregate Wet Density using Nuclear gauge in Direct Transmission	CL Soil – 1.91 pcf ML Soil – 2.15 pcf SP Soil – 1.86 pcf	AASHTO T-310 / VTM 10
Soil/Aggregate Density using Sand Cone	2.0 pcf	ASTM D1556 / AASHTO T-217
Soil/Aggregate Moisture using Nuclear gauge (backscatter)	CL Soil – 1.44 pcf ML Soil – 1.63 pcf SP Soil – 2.10 pcf	AASHTO T-310 / VTM 10
Soil/Aggregate Moisture determined by oven dry	14% difference*	ASTM D2216 / AASHTO T-265
One Point Proctor - density	4.5 pcf	AASHTO T-99 Method A
One Point Proctor - moisture	15% difference*	AASHTO T-99 Method A
Concrete Slump	0.82 inch for 1" to 2" slump 1.10 inch for 3" to 4" slump 1.50 inch for 5" to 6" slump	ASTM C143
Concrete Air-	0.8% points using pressure meter 32% difference using roller meter	ASTM C 231 ASTM C 173
Concrete Temperature	1 degree F	ASTM C 1064
Concrete Unit Weight	2.31 pcf	ASTM C 138
Concrete Permeability	51% difference*	VTM 112
Concrete Strength	8% difference on the average of 3 cylinders	ASTM C39 ASTM C31
Asphalt Bulk Specific Gravity	0.02	AASHTO T-166 / VTM 6

* Percent difference calculation shall be % diff ≤ ({absolute value[W1-W2]} / ((1/2) * (W1+W2))) * 100

*These IA tolerances are meant to be used when comparing split samples tested independently by QC tester with their test equipment and IA tester with his/her test equipment. These tolerances are based on the D2S rating between laboratories. Example: the QC test for slump on concrete sample taken out of a wheel barrow is 5 ¼ ". The IA test on that same sample (out of the same wheel barrow should be within 3 ¾" to 6 ¾" to be considered confirming the test equipment and procedures between the two tester is the same.

PAVING PROJECT EXAMPLE

Go to Appendix 13.2.G Frequency Tables in the LAP Manual.

In Place Pavement Density (for all asphalt except Stone Matrix Asphalt (SMA))		VTM-006; VTM-32	**Density** - min. 1 core per location not long enough to establish roller pattern/control strip	**Density** - One (1) random core per 10 QC locations. Independent of contractor cores.	Obtain cores taken for density. Reweigh at least 10% of these cores in laboratory to confirm density. Observe one (1) density determination per ten (10) locations performed by QC technician. Minimum 1 per project.
			Depth checks of surface and intermediate material required only if specific plan depths are called for, not when plans specify rate of application. One (1) per 1/2 mile per lane width, minimum one (1) test per roadway, maximum lot size 2 mile (4 tests)		
Depth Checks		VTM-32		NA	Select one (1) QC core per five (5) lots and remeasure thickness. A minimum of one (1) per project.
In Place Pavement Density and Depth Checks by cores for Stone Matrix Asphalt (SMA)		VTM-006	Establish trial section and test sections. Minimum of one (1) sample per 1,000 feet with a maximum of 5 samples per day/night's production for density and depth for test sections. Three (3) cores for test strip.	Two (2) stratified random cores per one day/ night production obtained independently of contractor. Minimum two (2) per project.	Locality Representative Independently weigh and measure a minimum of one (1) QC core per day/night's production Locality representative will observe the taking of these cores and will maintain control of these cores once obtained
Permanent Pavement Marking	VDOT Section 512		**Contractor QC Testing**	**VST**	**IA**

IN-PLACE DENSITY TEST

- **Contractor QC – 1 core**
- **VST – 1 core**
- **IA – Observe 1 density test per 10 performed by QC, obtain all cores, reweigh 10%, minimum 1 per project.**

PAVING PROJECT EXAMPLE

**NOTE: If items are not in Frequency Tables, then refer to the Materials Manual of Instructions. The District Project Coordinator or Construction Project Monitor will coordinate discussions with the District Materials Engineer or Central office Materials Program Manager.

LAP Manual Updates

- **Outcome of Presentation**
  - **What are the major changes being made to the LAP Manual?**
  - **What is the localities' role in executing an effective Quality Assurance Plan?**
  - **Why is the Acceptance/Verification Process important?**
  - **What documentation is needed for Material Acceptance?**
  - **What are some benefits to changes in the LAP Manual?**

Questions

LAP Manual Updates

Last Chance…

Materials updates to the LAP Manual sections 13.1 and 13.2 are scheduled to be published by the end of March

Submit any final comments or recommendations to:

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- **Russ Dudley ~ 804-786-6663 ~ russ.dudley@vdot.virginia.gov**

Locally Administered Projects Manual Updates & Materials Quality Assurance Plan Requirements

March 19, 2015

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